

SEC. 9. At all second-class stations six daily meteorological observations shall be made at times to be specified by the Director, and the results for each month shall be compiled and forwarded to the central station before the end of the next succeeding month. Such daily telegraphic reports of the state of the weather shall be forwarded to the central station as the Director may require. Monthly crop reports shall be forwarded to the central station by mail.

SEC. 10. At all third-class stations two daily meteorological observations shall be made, at hours to be fixed by the Director. They shall be forwarded to Manila by wire, if possible, otherwise by mail. Monthly crop reports shall be forwarded by mail.

SEC. 11. At all rain stations there shall be recorded the daily maximum and minimum temperature, barometric readings at 6 a. m. and 2 p. m., and daily rainfall. Reports from rain stations shall be forwarded by mail to the central station, together with monthly crop reports.

SEC. 12. Officers or employees of the Bureau employed in the establishment of stations shall be allowed their actual and necessary traveling expenses and the actual cost of transportation of instruments, apparatus, and shelters for the same. The nine first-class stations shall be established by the Director immediately, and the other stations authorized in Section 6 as soon as practicable. Employees for the several stations shall be appointed as they are established.

SEC. 13. The officers and employees of the weather bureau shall make such observations and reports on astronomical, magnetic, and seismic phenomena as the Director may prescribe. The results of such observations may be included in the monthly reports when their publication is deemed desirable by the Director.

SEC. 14. The Director shall cause standard time to be furnished to the city of Manila at noon daily, and to all branch stations in telegraphic communication with the central station at 11 a. m., daily. He shall further provide for the free rating of all chronometers brought to the Manila Observatory for this purpose.

SEC. 15. The following sums in money of the United States are hereby appropriated for the purposes named:

(a) For the purchase of additional instruments and apparatus for the equipment of nine (9) first-class stations, and for suitable shelters for the same, one thousand, seven hundred and eighty dollars and fifty cents (\$1,708.50).

(b) For the erection of shelters and the installation of instruments for nine (9) first-class stations, five hundred dollars (\$500.)

(c) For the purchase of instruments and apparatus sufficient to equip twenty-five (25) second-class stations, for shelters for the same and for cost of installation, four thousand, two hundred and fifty dollars (\$4,250).

(d) For the purchase of instruments and apparatus sufficient to equip seventeen (17) third-class stations, and for the installation of the same, one thousand and eighty-eight dollars (\$1,088).

(e) For the purchase of instruments and apparatus sufficient to equip twenty (20) rain stations, five hundred and twenty dollars (\$520).

SEC. 16. This act shall take effect on its passage.

Enacted, May 22, 1901.

#### THE AUTUMN HAZE.

In reply to a letter asking the Chief of Bureau as to the nature of the haze or hazy weather called Indian Summer, the following has been sent:

The dry haze is undoubtedly due to fine particles of dust. The finest dust is composed of one or all of the following substances, namely, fine

particles of soil or the dead leaves of plants, smoke, or ashes from wood fires, salt from the ocean spray, the shells or scales of microscopic silicious diatoms, germs of fungi, spores of ferns, pollen of flowers, etc. In the still air of damp nights these dust particles settle slowly down, or rapidly if they gather dew on themselves, and the morning air is comparatively clear. During the daylight the sun warms the soil which heats the adjacent air and the rising currents carry the dust up as high as they go. Up to this height the air becomes more and more dusty day after day depending on the balance between the settling by night and the rising by day. If a general wind is blowing this will bring an abundance of fresh air, and the haze is generally diminished thereby in intensity but spread over a large area of ground. If there be no general wind, as for instance in the midst of areas of high pressure (where the daytime is warm, dry, and clear), then the layer of dust reaches higher and higher each successive day; during long, dry summers in India it rises to 3,000, 5,000 and 7,000 feet with a well defined upper surface that is higher in the daytime than at night-time. This is a general explanation of dry-haze weather, and applies to Indian Summer as well as to all occasional areas of high pressure. The reason why we have more of it in the autumn is because there is then less horizontal wind and less rising air. The reason for the diminished horizontal wind is probably found in the general circulation of the atmosphere. The reason for the feebler vertical ascending currents is because the surface of the ground is not then heated warm enough by the sun relative to the temperature of the air to make such strong ascending currents as occur in midsummer.

#### THE MOON AND THE WEATHER.

We print on page 372 an interesting letter under the above title from the venerable Levi W. Meech, of Norwich, Conn., well known to American meteorologists by his laborious work *On the Relative Intensity of the Heat and Light of the Sun received by the Earth at different Latitudes*, and published by the Smithsonian Institution in 1856. Mr. Meech was at that time, as he has always been, a high authority on the mathematical principles that underlie the business of the actuary of a life insurance company, and this mathematical memoir was but a side issue in his life work. The article now published shows that long since he executed a computation that would undoubtedly bring out the influence of the moon on atmospheric phenomena if it could be applied to normal values for a large number of stations representing the whole earth. The present communication illustrates the form of the result that would be given by each station, but the question as to whether all data conspire to show the existence of a lunar influence must not be inferred prematurely from the evidence furnished by one station for one year. If temperature formulæ were at hand for many stations during the period September, 1853–April, 1855, for which Mr. Meech has computed the formula for Dr. Kane's station, we should naturally compare together the different sets of coefficients of the terms containing the sine and cosine of  $m$ , as also of  $2m$ ,  $3m$ , etc.; the average of all for the whole earth would show the influence of the moon. When we have but one station formula we can only ask what are the "probable errors" of the coefficients of sine and cosine  $m$ . On this point, unfortunately, Mr. Meech gives us no information.

A new journal, now published in St. Petersburg, is devoted to the exploitation of the lunar influence, and seems to assume that it must necessarily be large and important. It has lately printed a general review of the literature of the subject, but as is generally well known, every exact investigation throws doubt upon the subject whether the moon has any importance in meteorology. Perhaps the moon ought to influence the weather—but it doesn't. The controversies over this subject, waged during the 18th century, sobered down during the 19th century to the general conviction that the moon's influence is so slight that we really ought not to waste our time discussing it so long as the solar influence claims our undivided attention. It is to be hoped that dur-